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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/629.093 07/31/00 MAEDA

T 1272.00422

005514 MMC1/0906
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EXAMINER

NGUYEN, L.

ART UNIT

PAPER NUMBER

2861

DATE MAILED:

09/06/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/629,093

Applicant(s)
Maeda et al.

Examiner
Lamson Nguyen

Art Unit
2861



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 7-13, 15, 17, and 18 is/are rejected.
- 7) ☒ Claim(s) 4, 6, 14, and 16 is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 5 20) ☐ Other:

Art Unit: 2861

08/28/01

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3, 5, 7-11, 13, 15, 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al. (6,164,756) in view of Fujita et al. (6,003,970).

Takahashi et al. teach an ink jet printing apparatus and printing method comprising the following:

* a printhead having a plurality of nozzle groups, each having a plurality of nozzles (figure 2B)

* means for performing a plurality of main scans on one and the same main scan print area of the print medium using different nozzle groups and for forming an image (figure 6)

Art Unit: 2861

08/28/01

* printing duty setting means for dividing the same main scan print area at a predetermined pitch a subscan direction different from a main scan direction and for setting printing duties of the divided areas (figure 13; figure 6)

* the printhead has a plurality of nozzle columns corresponding to color inks and ejects ink droplets according to color print data to form a color image (figure 2B)

* the printhead generates bubbles in ink by thermal energy and ejects ink by a pressure of bubbles (column 6, lines 60-67)

Takahashi et al. do not specifically teach the following:

* thinning out mask patterns

* the thinning out mask pattern has a lower resolution than that of an image being printed

* an amount of ink ejected from each nozzle of the printhead in one ejection operation is 4 pl or less

* printed dots having an average diameter of 50 um or less

* print density of 600 dpi or higher

Fujita et al. teach an ink jet printer that performs thinning-out masking patterns (figure 10c) in which the hatched dots are printed by nozzles 5 through 8 and the white dots are printed by nozzles 1-4. Fujita et al. in figures 10B-D thinning-out printing from the first scan through third scan, wherein the resulting resolution in figure 10D is higher than that of figures 10B-C.

Art Unit: 2861

08/28/01

Fujita et al. teach varied amount of ink drops (figure 18) according to types of ink being used. Therefore, Fujita et al. suggest that the ink amount and ink dot diameter can be varied (figure 16A teaches dot diameter of 42.3 μm). Fujita et al. also teach increasing ink volume according to different resolutions (figure 17)

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the invention of Takahashi et al. to incorporate the teaching of thinning-out mask patterns, ink dot diameter of less than 50 μm , and resolution of 600 dpi or higher taught by Fujita et al. for the purpose of achieving quality printing results.

Furthermore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to make the amount of ink ejected from each nozzle to be less than 4 pl for the purpose of achieving higher resolution, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

3. Claims 2 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al. in view of Fujita et al. as applied to claims 1 and 11 above, and further in view of Takagi et al. (5,384,587).

Art Unit: 2861

08/28/01

Takahashi et al. in view of Fujita et al. teach all claimed features of the invention except:

* print duties situated at the ends of the printhead are of smaller values than those situated on the inner side of the ends of the printhead

Takagi et al. teach an inkjet printer that prints lower density at the ends of the printhead than that in the center of the printhead (figure 4).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the invention of Takahashi et al. in view of Fujita et al. to incorporate the teaching of lower density at the ends of the printhead and higher density at the center of the printhead taught by Takagi et al. for the purpose of achieving printing results of better quality.

Allowable Subject Matter

4. Claims 4, 6, 14, and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Serial Number: 09/629,093

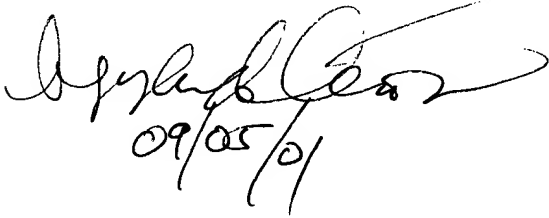
Page 6

Art Unit: 2861

08/28/01

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lamson D. Nguyen whose telephone number is (703)306-4547.

Ldn



09/05/01